

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE

		110FM02		
BITE VALVE ASSEMBLY, ITEM 110 ----- 0110-24777-07 (1)	2/2	Fails closed. IDB Bite Valve: Contamination or foreign matter. Damaged O-ring in mouthpiece, hole in mouthpiece, mouthpiece loose, clogged cover. DIDB Tubing Subassembly: Damaged or defective bite or dome valve. Contamination or foreign matter in bite or dome valve, drink tube, barb, or elbow port. Hole in drink tube.	END ITEM: Unable to access drinking water. GFE INTERFACE: Assembly will not provide drinking water. MISSION: Terminate EVA. CREW/VEHICLE: Crewmember dehydration. TIME TO EFFECT /ACTIONS: Minutes. TIME AVAILABLE: N/A TIME REQUIRED: N/A REDUNDANCY SCREENS: A-N/A B-N/A C-N/A	A. Design - IDB: The valve silicone O-ring and diaphragm cover prevents contamination from entering the bite valve assembly. The bite valve is cleaned with alcohol to remove contamination and foreign matter. The outlet valve is inserted into the bladder and wrapped tightly 7-9 times with polyester thread to prevent the outlet valve from leaking at the interface. The thread is tied off with a surgical knot and secure ends. The IDB is worn inside the HUT, which protects the valve from damage. DIDB Assembly: The disposable IDB Tubing sub-assembly is a 3 part assembly consisting of a silicon bite valve, a polyurethane drink tube and a nylon D-barb inserted into a polyethelene elbow port which is heat sealed into the bladder film interface to preclude leakage and prevent contamination. The D-barb is a 3 part assembly. A dome valve is inserted between 2 halves of the barb housing. The 2 halves are snap fit together and subsequently ultrasonically welded to retain the dome valve. The DIDB is contained within a reusable fabric restraint that is attached to the front wall of the HUT and protects the bladder assembly from damage. B. Test - Acceptance: Component. See inspection for acceptance. PDA: The following tests are conducted at the IDB and DIDB assembly level in accordance with ILC Document 0111-70028J(IDB) or 0111-710112(DIDB). 1. Proof pressure leakage tested in restraining fixture to 2.0 (+0.1 - 0.1)psig(IDB), 2.2 - 2.5 psig (DIDB). 2. Leak tested to verify no leakage through valve and hose assemblies (IDB) or DIDB tubing sub-assembly (DIDB). 3. Visual inspected to ensure no structural damage. Certification: IDB: 0110-82829-12: The IDB was successfully tested (manned) during SSA cert. to duplicate six years operational usage (Ref Cert. Test Report for the SSA, ILC Doc 0111-70027). The following usage reflecting requirements of significance to the IDB was documented during certification: The IDB was tested to the S/AD requirement for 144 cycles to achieve the 6-year life operational usage. 0110-82829-13/14: The following usage reflecting requirements of significance to the IDB was documented during certification, the IDB to the S/AD requirement of 144 cycles to achieve the 6-year life operational change. DIDB Assembly: The DIDB was successfully tested (manned) during certification to duplicate a single usage (with safety factor). (Ref. Cert. Test Report for the DIDB, ILC

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Doc. 0111-712763). The DIBD assembly successfully passed S/AD requirements including 64 actuations of the tubing sub. assembly to ensure proper operation.

Ten each DIBDs were randomly selected from the first production run of twenty (20) items. Each DIBD was subjected to and passed the following tests:

Requirements -----	S/AD ----	ACTUAL -----
Fill Cycles (using water)	1	2
Drain cycles (Bite Valve Actuation)	32	64
Installation/Removal into Restraint	1	2
Don/Doff	1	2

C. Inspection -
IDB/DIBD:

Components and materials manufactured to ILC requirements at an approved supplier are documented from procurement through shipping by the supplier. ILC incoming receiving inspection verifies that the materials received are as identified in the procurement documents, that no damage has occurred during shipment and that the supplier certifications have been received which provide traceability information.

During PDA, the following MIPs are performed at the IDB and DIBD assembly level in accordance with ILC Document 0111-70028J(IDB) or 0111-710112(DIBD): Visually inspected for material degradation or damage.

D. Failure History -

IDB:
None.
DIBD:
None.

E. Ground Turnaround -

All bladder assemblies:
During ground turnaround in accordance with FEMU-R-001, the IDB or DIBD restraint is subjected to structural and leakage (IDB only) tests and visual inspection for material damage or degradation. The DIBD bladder is not subjected to ground turn around since it is a disposable item.

F. Operational Use -

Crew Response:
Pre/Post EVA: Troubleshoot problem. If not successful, replace IDB/DIBD. If no replacement, terminate EVA.

Special Training: Standard EMU training covers this failure mode.

Operational Considerations -

Generic EVA Checklist, JSC-48023, procedures Section 3 (EMU Checkout) and 4 (EVA prep) verify hardware integrity and systems operational status prior to EVA. Real Time Data System allows ground monitoring of EMU systems.

EXTRAVEHICULAR MOBILITY UNIT
SYSTEMS SAFETY REVIEW PANEL REVIEW
FOR THE
I-110 IN-SUIT DRINK BAG (IDB)
CRITICAL ITEM LIST (CIL)
EMU CONTRACT NO. NAS 9-97150

Prepared by: *[Signature]*
HS - Project Engineering

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HS - Reliability

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R. Mumford 4/24/02
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NASA - S & MA

see attachment
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NASA - Crew

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NASA - Program Managers

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 SYSTEMS SAFETY REVIEW PANEL REVIEW
 FOR THE
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Prepared by: *[Signature]*
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